

WYETH'S METHOD OF HÆMOSTASIS IN AMPUTATION AT THE HIP AND SHOULDER.

REPORT OF PRIMARY AMPUTATIONS, ONE AT THE HIP JOINT,
THE OTHER A DOUBLE THIGH AND SHOULDER JOINT
AMPUTATION.

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Amputation at the Hip.—About midnight of November 25, 1905, A. L., male, white, age 18, fell from the platform of a passenger coach, the wheels of several trucks passing over his left lower extremity, reducing to a pulp the entire limb with the exception of the foot and knee. The femur was crushed within three inches of the great trochanter.

About thirty minutes after the accident he was admitted to the hospital and I arrived a few minutes later. The pulse respiration and general condition were fairly good, and the injury being of such a character that it was difficult to control hæmorrhage, I decided to amputate at the hip joint at once.

Chloroform followed by ether. I inserted the steel pins and applied the rubber tubing after the method of Wyeth. On account of the destruction of the skin a long, internal posterior and a short anterior flap was used. As the operation was proceeding a pint of normal salt solution with half an ounce of whiskey was injected into the subcutaneous tissues in the pectoral region. A quarter of a grain of sulphate of morphia and one-hundredth of a grain of sulphate of atropia had preceded the anæsthetic. The amputation was made with an ordinary scalpel and the vessels ligated as they were cut before retraction could take place. The head of the bone was removed with considerable difficulty on account of its being crushed off so short that no leverage could be obtained. By tying a piece of sterile gauze around the neck and using this to make traction the ligamentous attachments were cut with curved scissors and the scalpel and the bone was removed. A rubber drainage-tube was inserted extending up into the acetabulum and

projecting from the lowest portion of the wound, which was closed with silkworm-gut sutures.

Although practically no blood was lost, the patient toward the close of the operation began to show considerable signs of shock and was given a hot saline enema, one pint with one ounce of whiskey, before being removed from the operating-table. In addition $\frac{1}{30}$ of a grain of sulphate of strychnia and ten minims of the 1-1000 solution of chloride of adrenalin were hypodermatically administered. This enema, the whiskey being reduced to one-half an ounce and the hypodermatic injection, were repeated every three hours during the following twelve hours, and at 5 P. M. of November 26 an additional quarter of a grain of morphia was administered beneath the skin. This night he was also given three grains of calomel and soda at 8 o'clock and allowed nothing but liquids. All of the enemata were retained.

For the first twenty-four hours his temperature ran from 100 to $98\frac{3}{5}$, pulse from 120 to 164, respiration 30 to 20. On the following day, at 4 o'clock, A. M., he was given one half ounce of salts, which was promptly vomited. It seemed almost impossible to secure a movement from the bowels and injection of a quart of soapsuds was made into the lower bowel and retained. Two hours later one ounce of alum to a pint of water was thrown in and followed by a glycerine suppository. These were all retained and at 6 P. M. he was given an enema consisting of Fel. Bovis Pulv. \mathfrak{ss} Glycerine \mathfrak{vii} to two pints of water. The bowels moved promptly after this enema, the stool being copious and dark, chiefly liquid. The patient's condition immediately improved and his recovery was uneventful. The drainage-tube was removed on the third day; sutures on the tenth.

Double Amputation at Hip and Shoulder.—On September 14, I was called to see B. E. S., white, age 26, who had been run over by an engine, his left thigh being crushed in the middle third and his right arm crushed off at the shoulder joint. Shock had not supervened when I saw him, an hour after the accident, and I operated immediately under ether anæsthesia.

My first intention was to cut away the mangled tissues and endeavor to control the hæmorrhage, and later to complete the operation, but his condition seemed favorable and I proceeded to do the thigh amputation first and then the shoulder-joint.

Wyeth's pins and rubber tubing controlled the hæmorrhage as absolutely at the shoulder as at the hip in the first case. There was practically no loss of blood during the amputations. He was given a hot saline enema, one pint with one ounce of whiskey, before he was removed from the operating-table. He also had $\frac{1}{60}$ of a grain of sulphate of strychnia at intervals of three hours for the first twenty-four hours following the operation. The drainage-tubes were removed on the third day and the sutures on the tenth. The wounds healed by first intention and he was discharged at the end of twenty-four days.

The two cases are interesting from the fact that it is not customary to have such slight shock with such severe injuries. The shock would undoubtedly have been profound had the operation been postponed for any considerable length of time. I believe that by operating quickly, before shock occurs, a more favorable outlook may be expected. In any event, the mangled tissues should be cut away, hæmorrhage controlled by ligature or the rubber bandage, which should always be applied at the end of the stump and thus avoid the extreme pain which follows its application well above the injured area.

It is important, as advised by Estes, that the constriction of the rubber bandage should extend slightly above the crushed tissues in order to compress the veins and lymphatics and thus prevent the ingress of septic organisms or their products from the infected area.

The general practice of administering whiskey by the mouth gains nothing and makes vomiting more certain. It should be used by the rectum or hypodermatically. The infusion of warm normal salt solution, with strychnia and with the chloride of adrenalin and the direct application of heat, are our best means of preventing shock or inducing reaction.

I have observed that some of the severest cases of shock are preceded by little or no hæmorrhage. The transferring of these cases over rough roads or in unsuitable conveyances is very trying and often adds to the danger of inducing shock. Patients should be moved as little as possible. Hæmorrhage

should be controlled at once, heat applied, stimulation employed, and operation as soon as the patient's condition will allow.

The method of controlling hæmorrhage in amputation at the hip and shoulder-joint introduced to the profession by Professor John A. Wyeth in 1890 meets every requirement in these formidable amputations. The application is simple and it is so satisfactory that in my opinion there is no room for improvement. The gradual dissection method, without the application of the tourniquet, tying the vessels as you go, as advised by Estes, is tedious and is accompanied by a loss of blood which does not follow the Wyeth method, and in addition an unnecessary amount of time is consumed.

Instead of completing the disarticulation, as advised by Wyeth, before tying any of the blood-vessels, I have found it advisable to tie the vessels before removing the head of the bone for the reason that a certain retraction takes place when this large substance is removed and some of the vessels are more difficult to secure with certainty than when they are tied before the bone is removed.